

PATENT SPECIFICATION

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(54) A CLOSURE DEVICE

(71) I, KURT ALTEN, of 14 Ringstrasse, D 3015 Wennigsen, Germany (Fed. Rep.); a German national, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a closure device for closing the gap between the edge of an opening in a building and the rear of a vehicle when backed against it comprising an apron locatable adjacent the sides of the opening having a rigid displaceable support frame mounted on guide arms and normally spaced from said building and having pliable coverings extending from the sides thereof to the building.

The guide arms are intended to retain the frame in position and also support displaceable covering parts of the device. Moreover, the arms are also to permit a yielding movement to occur should a vehicle impact the device in a manner to produce forces which would tend to produce a swivelling movement. However, this has not occurred hitherto because the coverings are provided on both sides. The coverings, although flexible and deformable, due to their nature, do not permit the frame to effect an unobstructed swivelling movement upon indirect impact by a vehicle.

According to the present invention there is provided a closure device for closing a gap formed between the edge of an opening in a building and the rear of a vehicle when backed against it, comprising an apron locatable adjacent the sides of the opening having a rigid, displaceable support frame which is to be vertically located adjacent edges of the opening and spaced from the building, inclined guide arms on which said frame is mounted and adapted to be secured to the wall of the building defining said opening and pliable coverings provided on at least the sides of the frame and securable to the building to close the gap between the sides of the frame and said

building; said guide arms being adjustable in length and reduceable in length upon displacement of the support frame towards the building.

The guide arms are preferably formed in the manner of known shock absorbers in that the guide arms are made in two parts and both are telescopically displaceable in the other and preferably against the action of a return bias.

This longitudinal adjustability of the guide arms results in the outer ends of the guide arms connected to the frame, during pivotal movement of these guide arms, not describing an arc. Moreover, the outer ends now move substantially along a straight-line which in turn results in a substantially rectilinear aligning movement of the supports, and thus at right angles to their longitudinal extension or to the building. During such a movement of the side members of the frame the covering is not distorted at the side and adjustment of the device only occurs by bending and accordingly folding is produced thereby.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 is a fragmentary front view of a closure device for closing the gap between the edge of an opening in a building and the rear of a vehicle backed against the opening and which vehicle is to be loaded or unloaded through the opening in the building;

Fig. 2 is a section along the line II—II of Fig. 1;

Fig. 3 is an enlarged longitudinal section of a guide arm of Fig. 2; and

Fig. 4 is a section along the line IV—IV of Fig. 2.

A building 1 is illustrated having an opening 2 against which a vehicle is to be backed for loading or unloading.

The opening 2 is enclosed on three sides by a closure device including an apron having an inverted U-shaped frame 3 which is made of metal section and comprised of a horizontal web or crosspiece 4 located

above the opening 2 and two side-pieces 5 located on the sides of the opening 2 and secured to the building.

The side pieces 5 each have guide arms 6 connected thereto and rise at an angle of between 30° and 60° to the vertical preferably between 30 and 45°. The arms 6 are hingedly connected at their ends remote from the building with vertical side members 7 which together with horizontal crosspiece 9 are made of channel iron and form an inverted U-shaped frame 8 spaced from frame 3 and being the same size thereas. All the pivot axes of the guide arms 6 extend in parallel and horizontally. Two guide arms 6 support the right-hand portion and two of the guide arms 6 support the left-hand portion of the frame 8.

Strip-like aprons 10 made of a flexible, durable sheet material are provided and secured at the ends of the crosspiece 9 and on each of the members 7 so as to extend towards each other. A further strip-like apron 11 is secured by its upper edge to the crosspiece 9 and is freely suspended therefrom to extend parallel to crosspiece 9.

The frames 3 and 8 are interconnected by two lateral coverings 12 and an upper, horizontal covering 13 also made of the aforesaid sheet material. These coverings provide a weather protection above and to the side and the aprons 10 and 11 extending substantially at right angles to the planes in which coverings 12 and 13 lie are sealingly deformed when they are contacted by the rear of the vehicle (not shown in detail).

The guide arms 6 each comprise two tubes 14 and 15 telescopically arranged and each having securing eyelets 16 and which by the action of a compression spring 17 assume such a position that any reduction of spacing of the two securing eyelets 16 is possible only against the action of the compression spring 17. Moreover, the compression spring 17 in its position of maximum length (as shown in the drawings) is already under compression. Hence the plug 18, firmly connected to the tube 14 and located in tube 14, abuts against a pin 19 which is firmly secured to the tube 15. When compressive forces act on the securing eyelets 16 in accordance with a reduction of spacing, the compression spring 17 is then further tensioned whereby the pin 19 is displaced into a longitudinal slot 20 of the tube.

It is important that, when subject to the action of horizontal forces in accordance with the arrows 21, the frame 8 or the member 7 can execute a yielding movement in accordance with these arrows and there occurs a pivotal movement of the guide arms 6 whereby the upper securing eyelet moves in the direction towards the building

1 and also the compression spring 17 is further compressed. The upper securing eyelet 16 may move parallel to the arrows 21 or at right angles to the outer wall of the building 1 because of the adjustable nature of the guide arms 6 and need not execute an arcuate movement. The lateral coverings 12 may hence be deformed by bending without being diagonally distorted which would jeopardise natural folding and satisfactory yieldability.

The frame 8 may thus execute a substantially rectilinear movement in the direction of the arrows 21 even though it is suspended on inclined guide arms which have the advantage of simplicity and the possibility of supporting the displaceable parts of the closure device. Hence a movement, and deformation in the manner of a concertina occurs with normal use wherein forces are applied to effect horizontal rectilinear movement of the end extremities.

The deformation of the lateral portions of the closure device also permits the use of transparent foils for the coverings 12 and 13 and for certain other sections since, on account of the invention, reinforcing plies in the coverings, which do not enable transparent material to be used, may be dispensed with.

In order, moreover, to protect edges of the front portion of the device in the region of the members 7, resilient strips 24 may be provided and adhesively secured by, for example, cementing or welding, to the apron 10 and/or the covering 12.

WHAT I CLAIM IS:—

1. A closure device for closing a gap formed between the edge of an opening in a building and the rear of a vehicle when backed against it, comprising an apron locatable adjacent the sides of the opening having a rigid, displaceable support frame which is to be vertically located adjacent edges of the opening and spaced from the building, inclined guide arms on which said frame is mounted and adapted to be secured to the wall of the building defining said opening and pliable coverings provided on at least the sides of the frame and securable to the building to close the gap between the sides of the frame and said building; said guide arms being adjustable in length and reduceable in length upon displacement of the support frame towards the building.

2. A closure device as claimed in claim 1, in which the length of the guide arms is reduceable against the action of a return force.

3. A closure device as claimed in claim 1, in which the guide arms are in the form of telescopic shock absorbers.

4. A closure device as claimed in claim 1, in which the guide arms comprise two interengaging tubes which are telescopic to a limited extent and against the action of a compression spring located in the larger tube.
5. A closure device as claimed in claim 1, in which the guide arms, in their extended state, are inclined relative to the vertical by between 45° to 30° .
6. A closure device as claimed in claim 2, in which the return force means is a spring which is compressed in the non-retracted state of the guide arms.
7. A closure device as claimed in claims 1 and 2, in which at least the side members of the displaceable frame are supported only by the guide arms and the coverings are extended only by the guide arms.
8. A closure device as claimed in claim 1, in which a resilient protective strip is provided in the region of the side members.
9. A closure device as claimed in claim 8, in which the strip is adhesively secured.
10. A closure device as claimed in claim 1, in which the coverings are completely or partially transparent or translucent.
11. A closure device substantially as herein described with reference to and as illustrated in the accompanying drawings.
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